



Impact on Job Replacement and Economy by TAG-AI

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Abstract: This paper deals with the job impact and research strategy for its economic influence by the text-to-image function of ChatGPT (TAG-AI: Text to Art Generative AI), which gives a total impact in many areas because we can implement image and design with ease normal editing works and speak including code development by using huge data and just simple text. Currently, young generations will have a big impact on their job selection because ChatGPT can do as well as humans can design it everywhere.

Therefore, education methods and resulting economic impact factors should be rearranged as new curriculums and strategies. Especially, artists, video, photographers, designers, and fashion designers will be impacted by the text-to-image function of ChatGPT. However, the government and officers do not understand well how it is serious in education. This paper provides preparation materials and education methods including ChatGPT through analysing many papers and reports, and experiences about image generations of ChatGPT.

Keywords: ChatGPT, Generative AI, Education, Job replacement, Art creation.

I. INTRODUCTION

Currently, so many are introduced into creation such as image generation, drawing, photo generation, and storytelling. This is why the ChatGPT has a generation function and translation function after the current modal function. ChatGPT (Chat Generative Pre-Trained Transformer) AI can train and modulate functions.

When this model was developed by Mira Murati, some persons had ever negative position but several newspapers and analyst mention the impact of ChatGPT is bigger than the 2nd industrial revolution of 1700s. After this mention, several companies and ventures are developing many models (LLM) and reduced models (sLLM).

Currently, there are many models such as GPT, ULMfit (Universal Language Model fine tuning), LLaMA of developed by Meta, PaLM 2 of Google, BLOOM of BigScience, DALL·E 2 of OpenAI, DALL-E 2 and DALL·E 3 of OpenAI for Image, and others [17], [18].

The ChatGPT was developed for language train function but it has capability after modal function by supervised learning, unsupervised learning, and reinforcement learning. Therefore, its learning mechanism and model are simple. However, its impact is wide and big everywhere including in art.

As mentioned in the previous section, it started from language simply. However, its impacts are bigger and bigger in art generation areas because of its image training function and modification capability.

Currently, many are developing several models such as LLM, sLLM, and others to have an initiative on economic properties through customer services. Herein, its application and impact will be wider in the art generation areas. They are also trying to develop a simple model and widen services in several areas.

TAG-AI (Text to Art Generative AI) has a function that can translate from text to image easily when the user edits as text (prompt function). Therefore, its impact on image, photo, video, and related areas is wider and bigger than language application areas [20]-[27].

This paper mentions economic impacts, which impact will increase more video market, image generation of art or drawing, movie, news anker, animation, cartoon, u-tube market, and its application.

Currently, customers' communication patterns have been changed from multi and u-tube styles. It means that everybody can make video stations and communication hubs to build businesses or hobbies easily.

That is, as far as they want, they can make image and video art for their economic properties and interests. The art generation market by TAG-AI will increase more.

In June 2023, McKinsey predicts that generative AI will change higher labor productivity, higher education, and higher wages occupations, but this paper mentions that art generators and creators will be seriously influenced by TAG-AI.

TAG-AI will have an impact on economic growth and its impact is wide and more profoundly in occupations such as content writers, translators, customer servers, marketing promotion, legal professionals, document analyzer and makers, graphic designers, architects, artists, image generators, and visual content manipulation because of lifelong learning by easy learning image generation of TAG-AI [28].

First, generative AI is developed by data such as text, image, code, audio, video, and others but current generative AI has function by moderate function and its function will increase art generation by simple data. For instance, simple text will generate many wide images, videos, animation, and others.

It means that TAG-AI will be super generative in art areas and will influence economic growth factors. Therefore, this paper provides material for prediction research and motivation to research TAG-AI and education [29]-[33].

II. ANALYSIS OF CURRENT TAG-AI

There are several TAG-AIs. However, this paper describes the best TAG-AI and mentions. That is, many ChatGPT-based applications are developing and it is changing for our economic growing pattern and job changing. This paper provides current patterns for TAG-AI technologies and its application.

Table 1 shows the history of ChatGPT and Fig. 1 presents overview about the track of the Generative AI models. From this table we can see many models developed by several companies and researchers after ChatGPT of OpenAI in March 2023 [16].

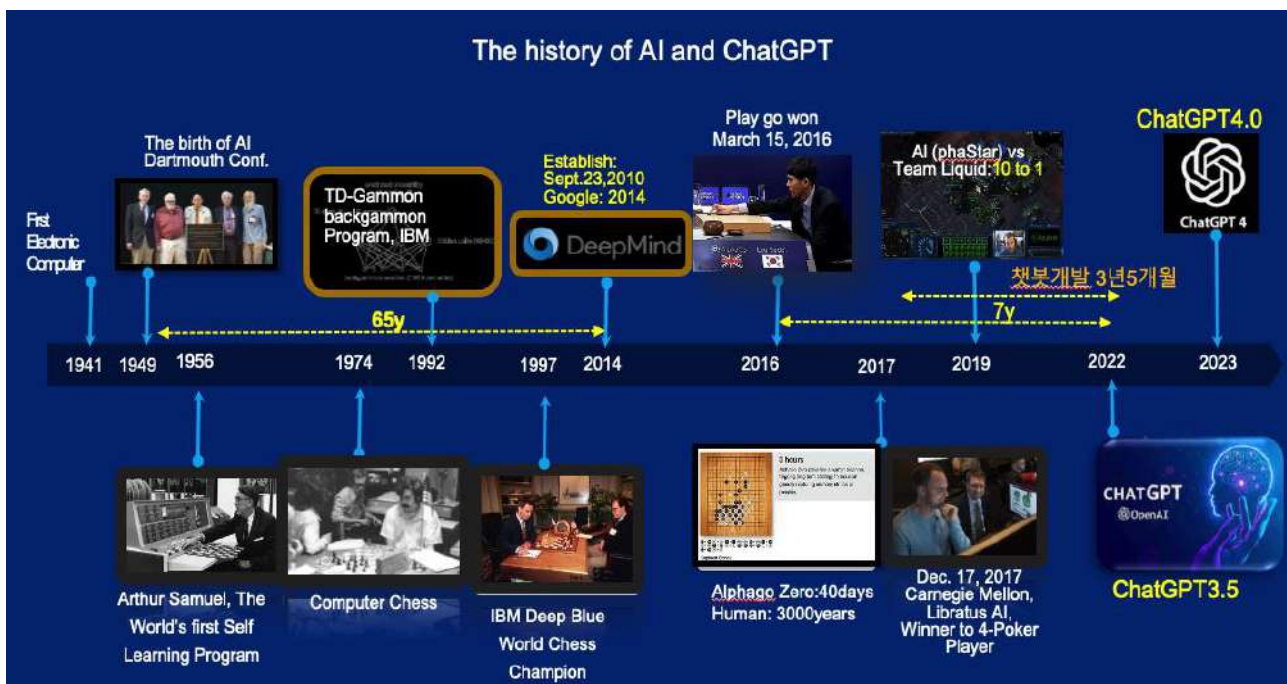


Fig. 1 The history of AI and ChatGPT

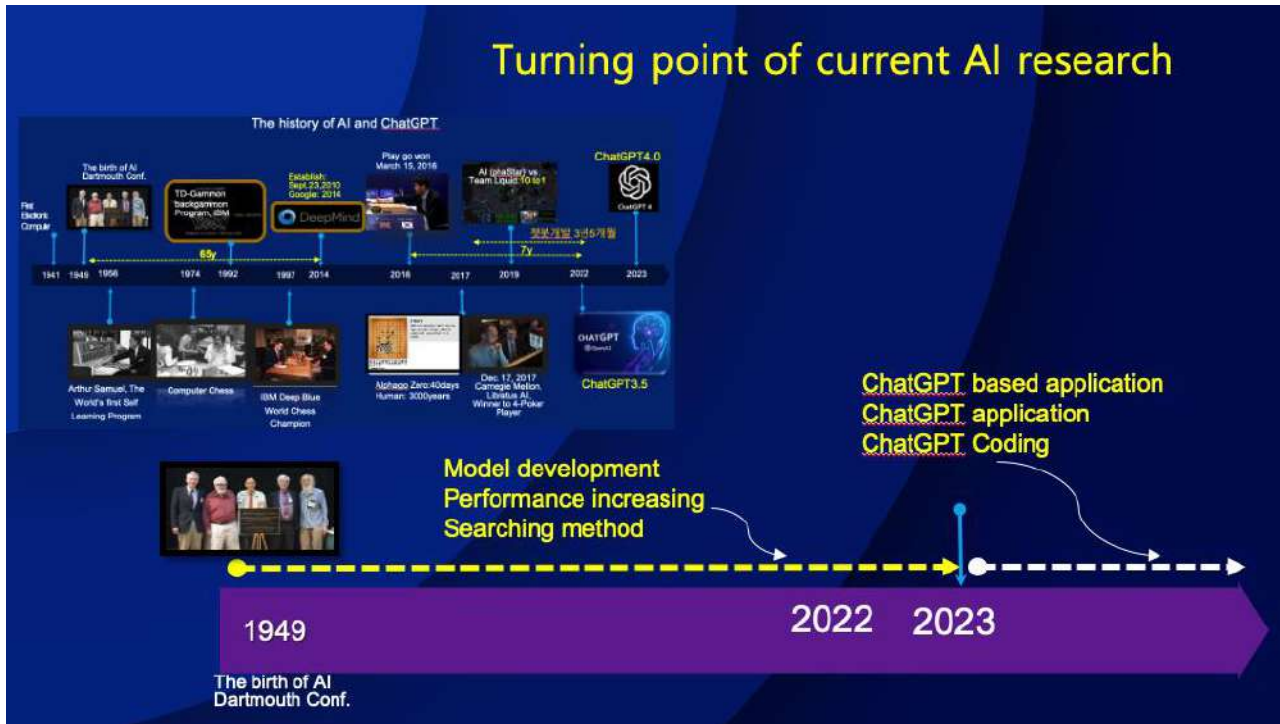


Fig. 2 Turing point of the history of AI and ChatGPT after ChatGPT4.0

Fig. 2 shows the history of AI till 2022 and Fig. 3 shows the history of AI and ChatGPT after ChatGPT4.0 released on March 2023. That is many developed and studied model, performance increasing, and searching methods before 2022, but after ChatGPT of 2023 their research methods were changed to ChatGPT based applications and applications directly. Table 1 presents more detailed history of ChatGPT. We can see many developers worked a new model like ChatGPT.

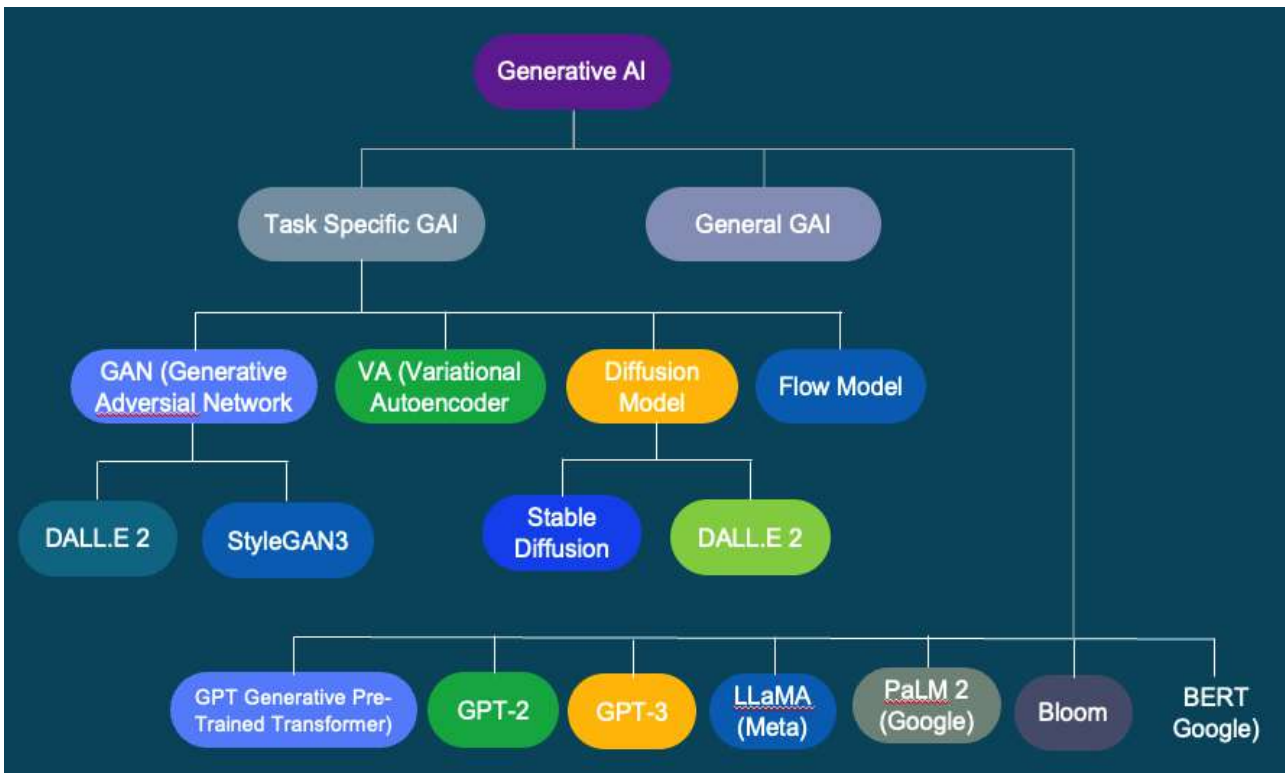


Fig.3 The track of Generative AI



A. ChatGPT of DALL-E3

This TAG-AI (Fig. 4) has a very strong model for text-to-image generation model. This model has three models such as DALL-E3-Pro (it is incredibly easy to use), DALL-E3-cons (widely available), DALL-E.

DALL-E3 provides a significant improvement because any given prompt produces more interesting, more realistic, and more consistent results. The best thing is ridiculously simple to use in DALL E 3 as TAG-AI.

DALL-E has the key features:

- Clean and simple to use online interface;
- Create digital art from your prompts, an uploaded image, or random text prompts;
- Favorite and save your best images into collections Unlimited image generations without watermark.



Fig. 4 Image by DALL-E2 (<https://zapier.com/blog/best-ai-image-generator/>)

B. Midjourney

There are three types such as Midjourney pro, Midjourney cons, and Midjourney. Midjourney consistently produces the AI image and community is a way to get inspiration.

Midjourney cons is only used through Discord and the image you generate is by default. Midjourney produces customer’s favorite results of all of the image generators on the list.



TABLE I CHATGPT HISTORY

Date	Description
11/Jun/2018	<u>GPT-1 announced on the OpenAI blog.</u>
14/Feb/2019	<u>GPT-2 announced on the OpenAI blog.</u>
28/May/2020	<u>Initial GPT-3 preprint paper</u> published to arXiv.
11/Jun/2020	<u>GPT-3 API private beta.</u>
22/Sep/2020	<u>GPT-3 licensed to Microsoft.</u>
18/Nov/2021	<u>GPT-3 API opened to the public.</u>
27/Jan/2022	<u>InstructGPT released as text-davinci-002</u> , now known as GPT-3.5. <u>InstructGPT preprint paper Mar/2022.</u>
28/Jul/2022	<u>Exploring data-optimal models with FIM</u> , paper on arXiv.
1/Sep/2022	GPT-3 model <u>pricing cut</u> by 66% for davinci model.
21/Sep/2022	<u>Whisper (speech recognition) announced on the OpenAI blog.</u>
28/Nov/2022	GPT-3.5 expanded to text-davinci-003, announced via email: 1. Higher quality writing. 2. Handles more complex instructions. 3. Better at longer form content generation.
30/Nov/2022	<u>ChatGPT announced on the OpenAI blog.</u>
1/Feb/2023	<u>ChatGPT hits 100 million monthly active unique users (via UBS report).</u> 21/
21/March/2023	ChatGPT-4
23/May2023	MS announce bing power ChatGPT browsing
21/July/2023	XAI established
04/Nov./2023	XAI Grok
6/Dec/2023	Google Gemini
Date	Description
11/July/2023	Medical ChatGPT Test
17/July/2023	Chingwha University announce model over GPT4
25/Feb/2023	Meta open LLaMa
23/Feb/2023	MS open ChatGPT for robot control
12/July/2023	Elonmusk establish xAI
24/July/20023	MS open TypeChat
25/July/2023	Stability announce AI model using small data
27/July/2023	Meta and Cambridge University open LLM to response speaking LLM
30/July/2023	Google announce vision-language-action: VLA for robot control using natural language
1/Aug/2023	Adobe announce player for figure
1/Aug/2023	NVIDIA announce image generator Perfusion optimized using Text and Prompt
3/Aug/2023	Korea venture announce over Chat GPT4.0
24/Aug/2023	Naver announce Hyper X

Midjourney has key features (Fig. 5):

Works within the Discord environment

- Generates four images at a time;
- Has the ability to merge multiple images with text prompts at a time;
- Has a strong community of like-minded digital artists who can help with prompts and sharing knowledge.

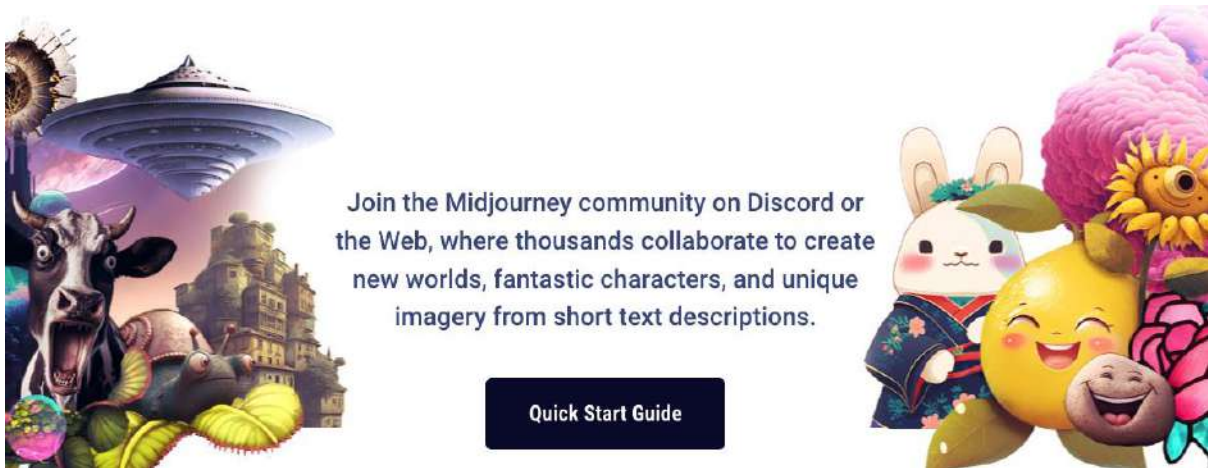


Fig. 5 Start Image by Midjourney (<https://docs.midjourney.com/>)

C. DreaStudio

There two types DreaStudio pros and DreaStudio cons. DreaStudio ihas only a major AI picture generatorDreaStuio has more of a learning curve than other AI art generators. This DreaStudio has a stable open source. Therefore, anyone downloads technical skills and run it on their PC. That is, you can train and fine-tune the model for your specific purpose. This DreaStudio provides a huge amount of various aspects of images generated with AI.

D. Abohe Photoshop (Firefly)

Recently, Adobe released a text-to-image generator in beta. This model is called Firefly, which can create text effects from prompts written by customers. It can match DALL-E2. The particular feature of Firefly is called Generative Hill and can understand the context of customer images by clicking and prompt.

The Firefly is the first implementation tool of an AI photo generator an millions of professionals this apple every day.

E. Photosonic

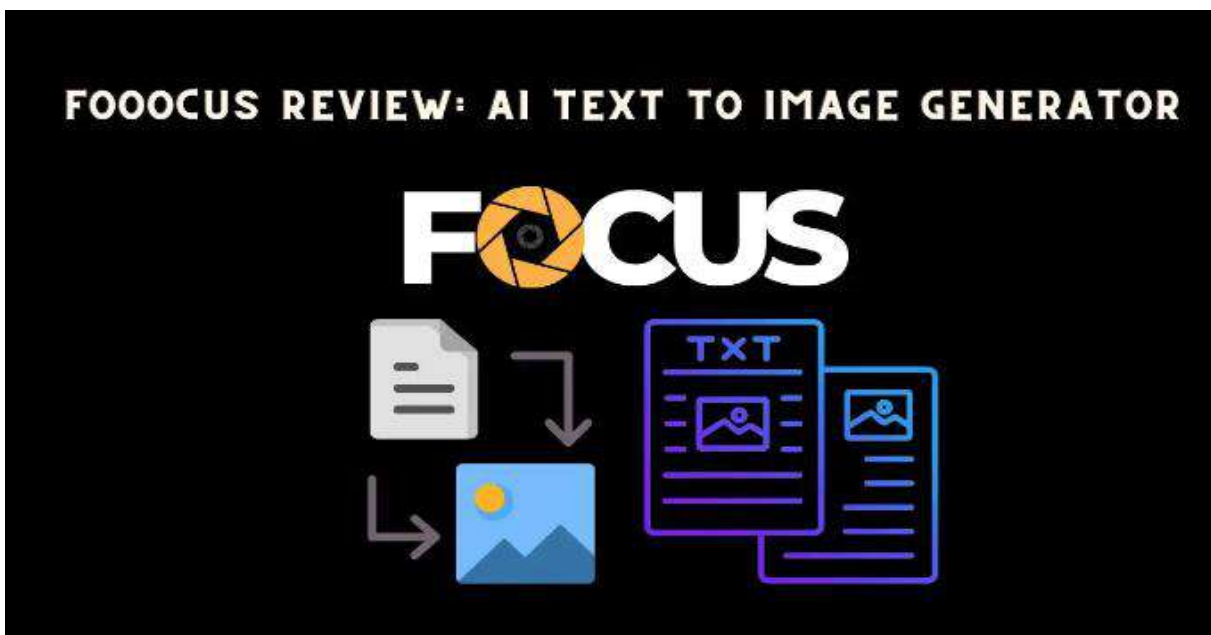


Fig. 6 Photosonic (<https://photosonic.pro/blog/>)

This model of Fig. 6 has three image functions such as horizontal, vertical, and square and it can generate up to five images at a time. It also can directly download images to your hard drive, and share your digital art on SNS (Facebook, Twitter, Pinterest, LinkedIn, Reddit, and Whatsapp).



Fig. 7 Jasper Art (https://www.jasper.ai/art?_from=ads&fp_sid=1-g-Cj0KCQIAj_CrBhD-ARIsAliMxT8m67dWSFqAE4P1Cv-WjLDEedB7UmbkOvivyEVQ8CfxdOJkqPMILgwaAhSGEALw_wcB&gad_source=1)

This AI text-to-image model can convert users' text prompts into images with style. This model has functions such as life photography, 3D images, animal portraits, cityscapes, abstract art, and others by a few lines of text.

F. Jasper Art

Jasper Art (Fig. 7) is an art generator, which can generate from your text into unique images, photos, and illustrations. It has key features:

- Adjust settings like mood, medium, inspiration, and style for your images;
- Accepts prompts in 30+ languages;
- Upload a reference photo and adjust it with text prompts and AI;
- Download graphics in three different sizes at 1:1 resolution;
- Copy, share, screenshot, and bookmark images with native tools.

G. NightCafe

This tool (Fig. 8) focuses on community-oriented text-to-image conversions for art contests, community exhibitions, and public albums, and other similar community. That is, it allows digital artists to establish a community of creative enthusiasts and having a shared passion for AI art.

It has key feature:

- Nine stable diffusion methods to choose from eleven preset styles;
- Five different aspect ratios: 1:1, 3:4, 4:3, 9:16, and 16:9 Find, start, or join chatrooms to create digital art collectively.

H. Image Creator from Microsoft Bing

MS Bing can offer a quick generation on the cyber arts. It has many functions illustrations, cartoons, and photos. Whether users provide detailed or minimal text prompts, this creator produces exceptional multimedia.

It has key:

- Easy-to-use interface;
- Share, save, and download AI-generated artwork Create collections of your favorite art or stay organized Generates four images at a time;
- Saves a history of generated images that you can re-edit and rescue over and over again.

I. Divi AI

This image AI (Fig. 8) services for website development as an assistant in WordPress. The users can achieve using the use of the Divi Theme or page builder plugin. This model has an AI based image generation for WordPress websites. As users construct their websites, Divi AI assists images, photographs, pop art, and more straight from the Divi Builder.

Customers can easily generate photography that aligns with your brand or striking graphics to enhance their website.

This tool allows you to upload and refine user images using text prompts and they can effortlessly remove unwanted details. Merely upload your photo, issue a command, and Divi AI will act accordingly. Divi AI model has a unique ability to craft and edit images directly on your WordPress website.

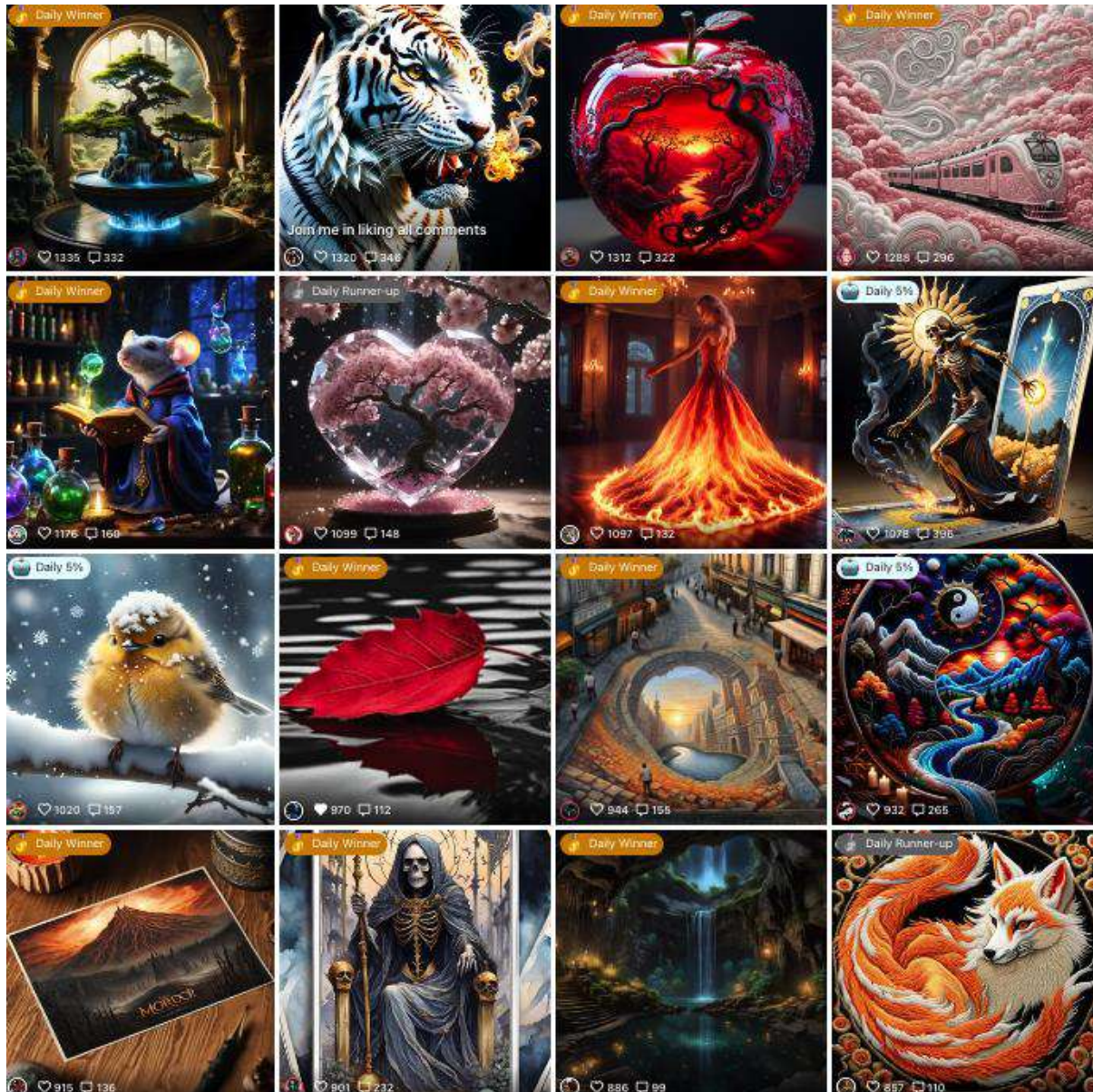


Fig. 8 NightCafe (<https://creator.nightcafe.studio/>)

This has features:

- Unlimited artwork generation and revisions Twelve image styles;
 - Generates four photos at a time;
 - Quickly generate images with AI directly in your WordPress page builder;
 - Three aspect ratios;
 - Set a custom size for your AI-generated artwork Upload a reference photo to adjust with text prompts
- Generate unlimited variations of artwork.

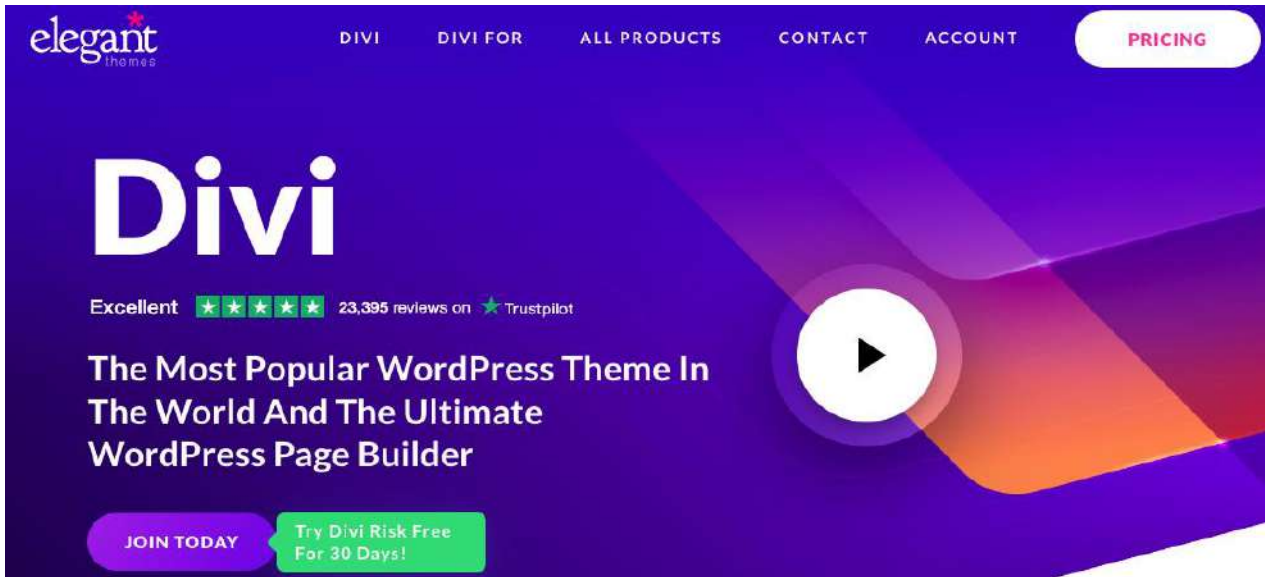


Fig. 9 Divi home page (<https://www.elegantthemes.com/gallery/divi/>)

J. Shutterstock AI

Shutterstock (Fig. 10) has top ranks among the top providers of stock photos, footage, and illustrations. It has many stock contents and is a good efficient tool for generating text-to-image art. It has features:

- Five image styles to choose from;
- Generates AI art in 300DPI;
- Download images in 512px or 1024px, 1:1 ratio Save images to your Shutterstock library.



Fig. 10 3D objective image of Shutterstock AI (https://www.shutterstock.com/ko/search/ai?image_type=3d-object)

L. Picsart

Picsart provides a photo and video editor complete with the generation of text-to-image, which has limitless creation of images using their design tools library. It provides diverse options such as JPG, GIF, and MP4 available.

Picsart has features:

- 35+ image styles and presets;
- Adjust the settings of your AI art using quality, colors, artist inspiration, and mood;
- Generates four images at a time;
- AI enhance feature, reduces blur, fixes details, adds pixels, and more to created art.

M. CF Spark

CF Spark (Fig. 11) is one of the leading text-to-image generators. CF Spark Art focuses on transforming text into digital masterpieces. Similarly, their CF Spark Pattern feature turns your text into repetitive patterns suitable for various uses, such as website backgrounds or desktop publishing documents. If you want to create compelling AI imagery, make CF Spark your platform of choice.

Its features:

- Eight image styles;
- Six aspect ratios to choose from;
- Save images to public or private collections;
- Feeds save your favorite prompts in a prompt library;
- Advanced prompt builder to help you build custom prompts and templates.

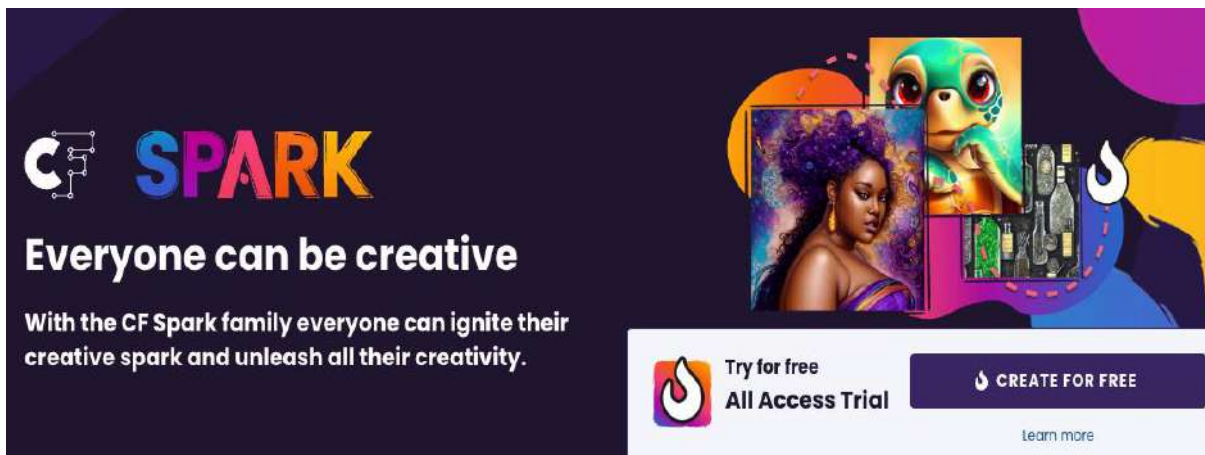


Fig. 11 CF Spark home

(https://www.creativefabrica.com/spark/?utm_source=google&utm_medium=cpc&utm_campaign=non-brand_pmax&utm_content=performance-max-row&gad_source=1&gclid=Cj0KCQiAj_CrBhD-ARIsAliMxT8y6LDwGOrCEcR2hBizTBimISiXA9fNcjknZrY9e7_IT9l2X6LvNNsaAiD4EALw_wcB)

About model of ChatGPT released by OpenAI, OpenAI describes their parameter to train as ChatGPT-3 175 billion parameters. (Arianna Johnson, Forbes Staff, March 2023).

ChatGPT-4 (Sanuj Bhatia, March 2023) has different parameter such as, positional parameter (it is function is to understand the order of words in sentence), learned parameter (which is making an accuracy of learning through weights and bias tuning), hyperparameters (Definition of the overall model structure and model behavior), and model configuration parameters (definition of the number of layer and nodes in each layer).

The number of parameters in a language learning model means a measure of model capacity for learning and complex understanding. That is, a language model with more parameters can learn more detailed and nuanced illustrates of language. So, it allows model to generate more detailed and various image.

Table 2 shows prices of models of text-to-image.



TABLE II PRICES OF MODELS

Tools	Price	Free option
Photosonic	16\$/month	O
Jasper art	49\$/month	X
Misjourney	0	O
DALL-E	\$15/115 credit	X
NightCafe	5.99\$/month	O
Bing	0	O
Dream	9.99\$/month	O
Divi AI	24\$/month	X
Shutterstock AI	24\$/month	X
Picsart	49\$/month	O
Canva	18.99/month	O
CF Spark	29\$/month	O

MS decided to invest \$ 10 billion in OpenAI to develop ChatGPT and introduce a new technology into their Bing search engine. MS also said that they invest a \$250 million fund to develop generative AI for startups in March 2023.

There are some reports (MIT review, 2021) that generative AI will change such as jobs (especially, a leading expert on the impact of technology) and GAI (Generative AI) will give a big influence on education and expertise. Basically, the ChatGPT will change many things such as word conversion, image transfer (image to text or vice versa), storytelling, image combining (protection against fraud or fake), and others. Therefore, there can happen large-scale unemployment. About this, they can say that replacement of job will be some social issues or problems unemployment. Despite this worry about GAI, AI developers will continue to provide human-like capability AI by their creation. And the other hand, using these related technologies, can improve the productivity of their workforce, and many reports predict that GAI will extend trillions of dollars in economic growth. Because a majority of the economy is developed and boosted by knowledge and its related combination in the 4th wave. Technologies depend on how to use this technology to transform businesses and make life as we did in the earlier revolution. It is, so far, just a little bit better to do the task because of the young age of AI. However, it will increase efficiency and productivity. It also will allow us to create new ideas and processes to develop for customers.

Meta

Meta opened its LLaMa2 as open source, which was pre-trained using 7 trillion, 130 trillion, 70 trillion parameters on July 18, 2023. They announced that FAIR (The Fundamental AI Research) of Meta also is studying through cooperation with Boston Dynamics on July 26, 2023 (<http://m.irobotnews.com>). LLAMA Model (Version 1) was developed from Dec 2022 to Feb. 2023, which is an auto-regressive language model based on the transformer and it can be trained easier because it is a smaller parameter than another model.

MS vs. Google vs. Meta

Item	 Microsoft	 Google	 Meta	Remark
Model name	Prometheus	LAMDA	<u>LLaMA</u>	
Open date	Feb 2023	May 2021	Feb 2023	
The number of Parameter	175 trillion	137 trillion	7 trillion 13 trillion 33 trillion 65 trillion	Meta: Source open Others: Not open
Service	Bing search Azure web	Bard (Google search)	Source open	
Description		mage (Muse) Music (AI MusicLM) Video (AI Imagen video)	Research 20 Language learning Service for content	

Fig. 12 Comparison MS, Google, and Meta of ChatGPT

N. Other Chat Platform

There are other Chatbot platform after releasing ChatGPT as we can see from Table 1 and Figure 1-11. It means its impact so big on the social, business, and job impact as well as economy. For example,

The working patterns of most art designer, video designer, photographer, animation designer, fashion designer, and related jobs should be changed from these text-to-image generator. Of course, economic leading pattern will be changed as we can see from Fig. 13.

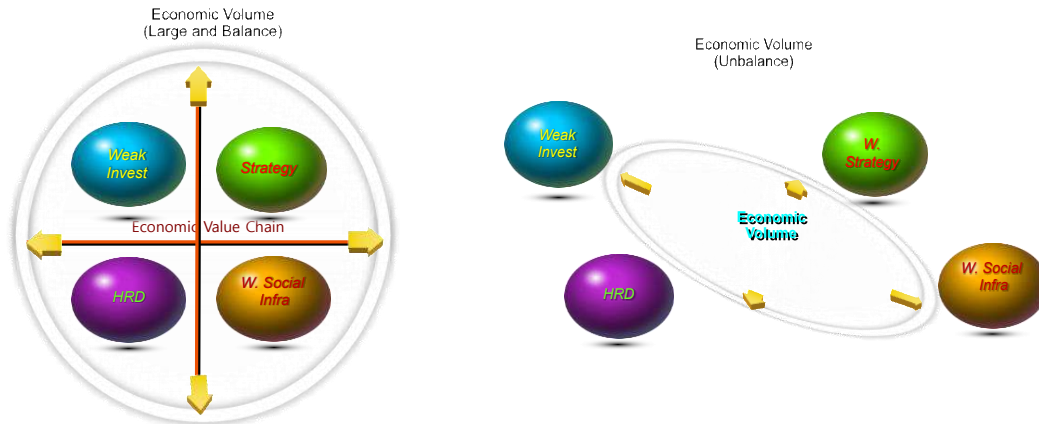


Fig. 13 Economic volume balance for simulation

III. EDUCATION FOR JOB CHANGING

As shown in Fig. 3 to Fig. 11, TAG-AI will change so much job pattern and economic leading pattern. Therefore, teaching method and learning purpose should be changed. That is, their curriculum has to design to this purpose. Fig. 14 and Fig. 15 show teaching strategy and curriculum. Namely, Fig. 15 shows the structure of the curriculum designed by this paper as an example. This curriculum has content of the generative AI and its basic principle for the student in every course designed in this paper. The users can modify this example structure and contents for their purpose.

Fig. 16 presents the market position of ChatGPT and AR/VR, and Blockchain. From this Fig. 16, the Generative AI has the very near market to pick point. We can expect the generative market is coming now.

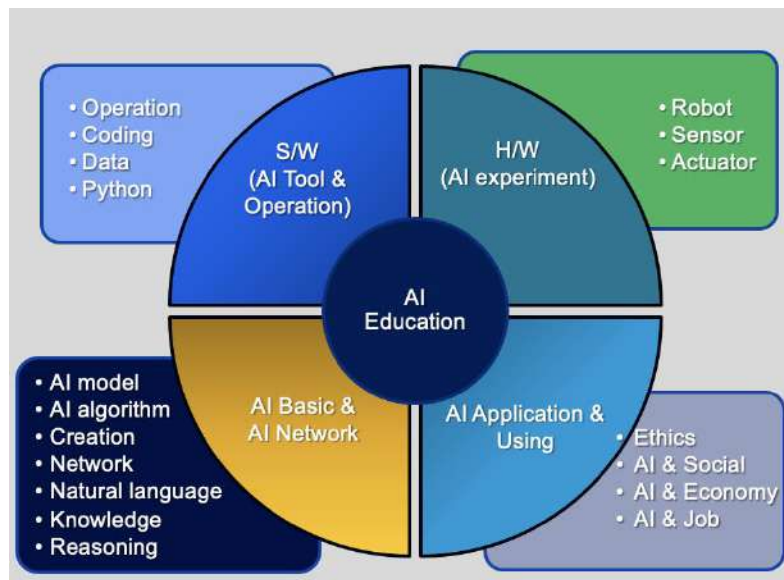


Fig. 14. AI education strategy for teaching.

Suggested AI Korea Curriculum structure for K-12	
AI and solution	9: AI & Solutions & Network: AI and society (Safety, Impact), AI and Economy (Job, Impact), Speech and Image recognition, Knowledge and Inference, AI Programming in working life, AI ethics, Data governance, Python, Team multi-disciplinary project, AI and Innovation, Work life skills for Targeted project, and GapiGPT (Network operation, textual programming software, animation, Web design,)
Deeper AI develop and implementation	8: AI and ICT/network: Network and AI, AI robot, AI ethics, ChatGPT, AI and ICT (Internet, computer security, privacy, information, communication, Team multi-disciplinary project and Current AI)
	7: AI deep technology: AI category and implementation method, AI ethics, ChatGPT AR/VR, and Machine/Deep learning (Function, modular, AI, machine vision, processing, probability, Team multi-disciplinary project)
Wide understanding AI	6: AI and developing: Developing a learning, AI ethics, Knowledge development, and ChatGPT (Variable, Boolean logic, project, product design, development process, game design, cooperative creation, creativity, knowledge development, Team multi-disciplinary project)
	5: AI and implementation: AI and intelligent robot, coding (Python and scratch), Knowledge inference, AI ethics, ChatGPT (Sensor, actuator, embedded system, automation, variables, knowledge and creative thinking, Team multi-disciplinary project)
AI deep understanding	4: Computing and AI: Computing technology, Coding and AI, AI robot, AI ethics, and ChatGpt (AI, mathematics, science, language, creativity, integration, Knowledge inference, multi-disciplinary projects)
	3: Code & Creative AI: Code AI, game AI, AI ethics, AI speech and recognition, AI and Data, and ChatGPT(Loop, condition, statement, project, design, game development, cooperative and creative,)
AI foundation	2: Coding & Learn AI: AI basic principle and coding, Code and robot (Smart machine), Data principle and AI, AI and Smart life, AI Ethics, and Chat GPT (Visual programming, animation, coding and playing, digital creation, cooperation, Team multi-disciplinary project)
	1: Play & Coding AI: Human robots and code introductions through play and games, Data, AI ethics, and Chat GPT (Sequence, command, loop, play, cooperation, animation)
Kindergarten	0: Playing game AI: Basic concepts and creative knowledge, Basic programming, ethics (AI, technology, creativity, play, activity, Useful using)
	0: AI play and Game: Computational & Knowledge thinking, AI definition (Thinking, Technology, AI play, and Cooperation with AI, Ethics and AI)

* Number (step): Main subject: education topic (contents)

Fig. 15 Designed AI curriculum for AI education

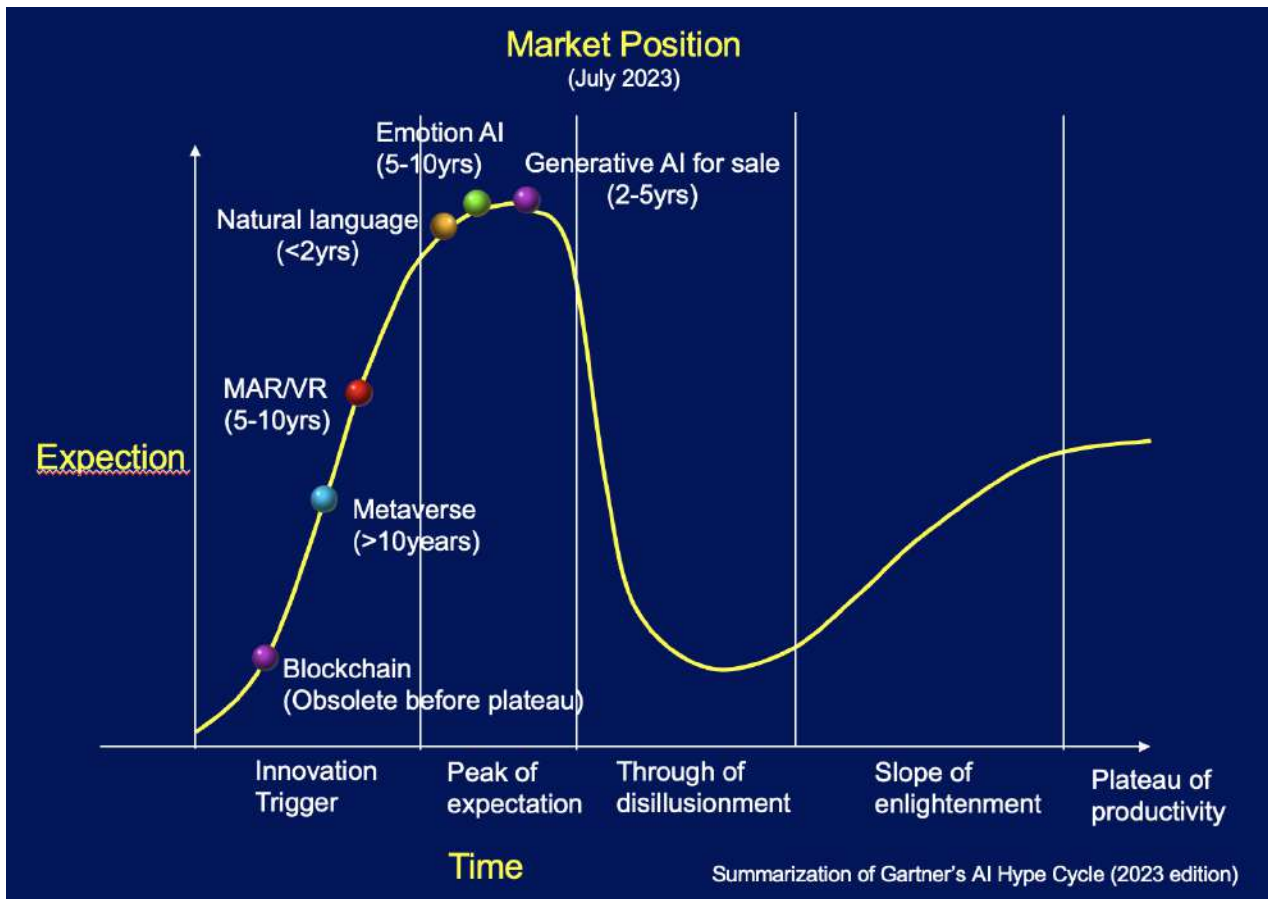


Fig. 16 Market position of generative

IV. RESEARCH STRATEGY

To research the impact of TAG-AI, this paper suggests as shown in Fig. 17. Basically, the economic balance can be shown as presented on the left side of Fig. 13. However, if this balance is crashed (unbalanced), the economic leading factor is changed, the economic impact will change as shown in the right side of Fig. 13. In the simulation process, this paper enter data and can find the impacts of TAG-AI.

Fig. 17 shows the simulation process to study the influences of TAG-AI and Fig. 15 is the research strategy for terms.

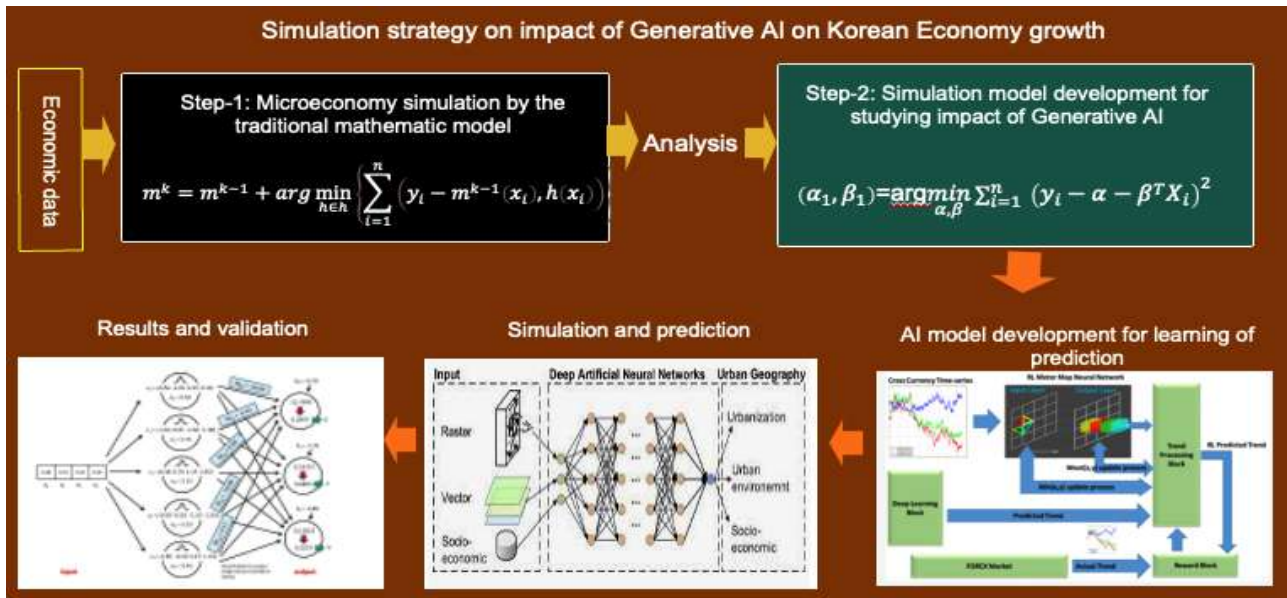


Fig. 17 Economic volume balance simulation process by impact of ChatGPT

Fig. 18 shows on how research strategy should be progressed for research terms. In this paper, it is shown as one year but users can modify for their terms (one or several years).

V. CONCLUSION

This paper provides materials and methods for preparation, education, and research strategy for how will image market be influenced and economy including education system issues will be impacted by a text-to-image function of ChatGPT. It has a leading factor in economic areas and jobs including education because the text-to-image function of ChatGPT has various aspect creation methods as well as applications such as video, photo, and animation. Without preparing for these impacts, young generators cannot get jobs and survive.

The role of lecturers has changed during the AI and ChatGPT revolution.

The OpenAI released ChatGPT3.5 on Dec. 2021 and they opened ChatGpt4.0 on March 2023. Its impact is serious in education systems like K-12 (Fig. 15). It means that the education system should prepare for AI's impact on traditional education and will have an impact on job patterns and resulting economic issues.

The impact of ChatGPT can be evaluated through two methods:

- Adoption resulting in some areas of technologies and art areas mentioned in this paper
- The work activities (job patterns) and education by ChatGPT.

At present, ChatGPT and its related emerging technologies hold the potential to automate work activities that currently reduce employees' working time (some reports mention will reduce 60 to 70% of consumer but this paper does not mention this %). With the growth of ChatGPT, policy maker, business leaders, educator, and other important stakeholders should learn how to manage inherent risks associated with the technology.

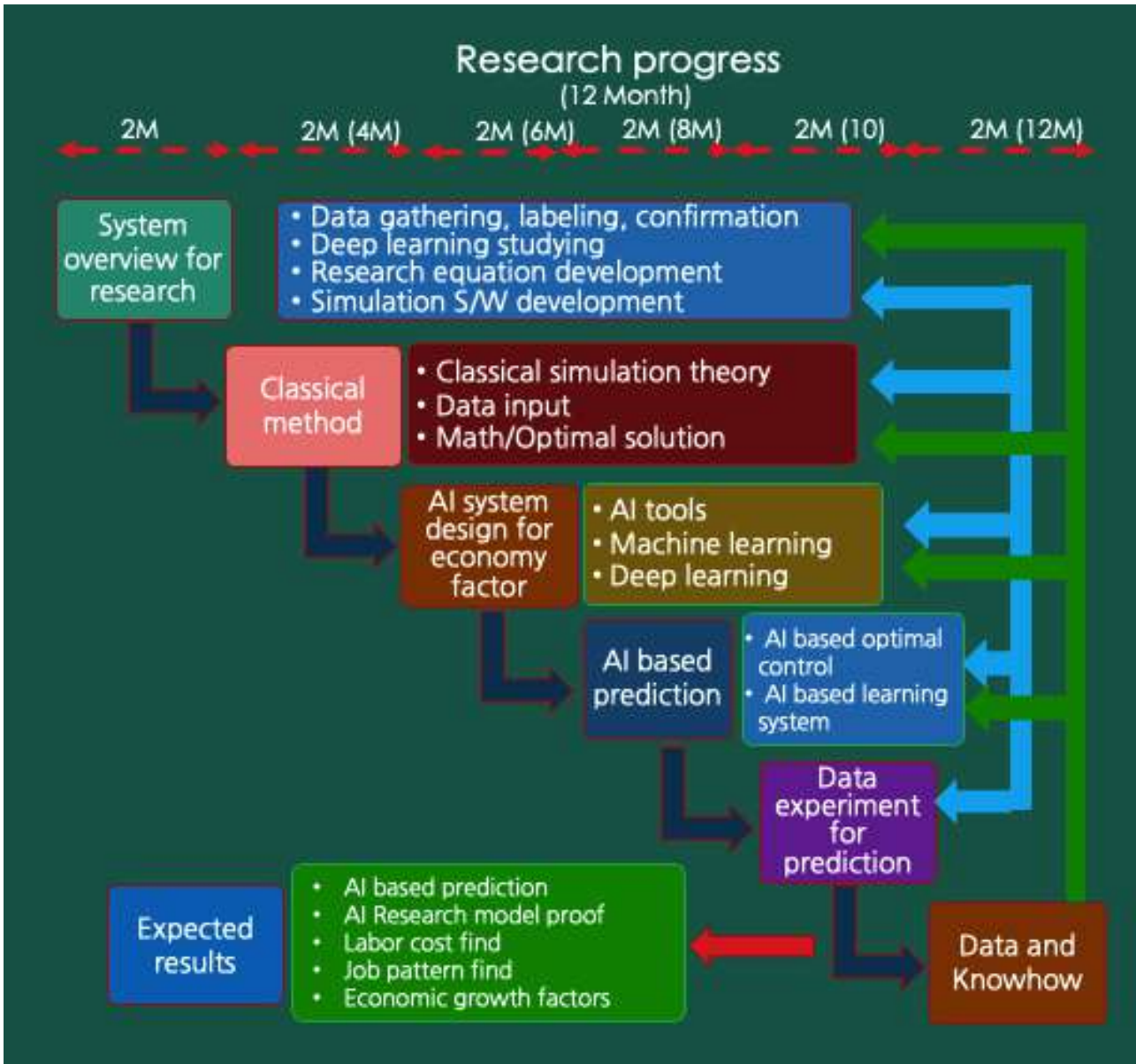


Fig. 18 Research strategy during research terms.

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